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UNITHERM FOOD SYSTEMS, INC.
1108 WEST HARTFORD AVE.
PONCA CITY, OKLAHOMA 74601
TELEPHONE: 580-762-0197
FAX: 580-762-0199
E-MAIL: unitherm@unithermfoodsystems.com



A WORLD OF STAINLESS STEEL PRODUCTS

February 19, 1998

Mr. Bob Junker
IOWA HAM INC.
812 Third St. N.W.
Independence, IA 50644

Via Fax # 319-334-7259

Dear Bob:

It was a pleasure to meet both you and Greg during your visit to Ponca City earlier this week. We at UNITHERM appreciate the opportunity to work with IOWA HAM and demonstrate the capabilities of the RapidFlow Continuous Convection Oven System. I was encouraged by the initial test results we achieved and remain confident that we can meet all of your requirements using this system.

As you recall, we were successful in matching the target color of the Virginia Brand Hams while you were here. The matching ham is labeled "5A" and "5B". This was achieved using a 100% solution of your caramel blend and a residence time in the cook zone of the oven of approximately nine minutes. Operating parameters for the oven were consistent throughout the testing — temperatures were set at 550° F. in zone one, and 650° F. in zone two. Based on these settings and an average weight of 14 pounds per ham, this system will achieve a throughput of approximately 5,500 lbs / hour.

The Honey Hams were run on Wednesday, after the Super Smoke arrived from Hickory Specialties. I have sent four Honey Hams to illustrate the results achieved with the Super Smoke. Hams #1 and #2 were run with a residence time in the cook zone of nine minutes. A 50% solution of Super Smoke was used to achieve this color, which is extremely close to matching the target piece. The other pieces represent variations in the test parameters. Ham #3 was run using a 30% dilution of Super Smoke and a residence time of eight minutes. Ham #4 was run using a 30% solution of Super Smoke with a residence time of seven minutes. As you can see, residence time and smoke concentration have a significant impact on color development.

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U-8133

PTO-004182

February 19, 1998

While you were here, you requested pricing information on this system. The following is a quotation on the components of the turnkey package.

Bag Slitter	\$ 45,000
Infra-Red Purge Removal	\$ 48,500
Liquid Smoke Applicator	\$ 45,000
RapidFlow Oven	\$175,000 per zone
Mechanical Chiller	\$300,000

To produce the volume of 5,500 lbs per hour as discussed earlier, you would require a Two-Zone RapidFlow Oven. The other piece which is critical to this operation is the Liquid Smoke Applicator. The other pieces are optional and can be included or not, as you wish.

Although you received only a brief demonstration of the Bag Slitter, this piece of equipment can affect your bottom line significantly, and should receive your consideration, regardless of whether or not you decide to purchase a RapidFlow Oven System. It is capable of slitting between 16 and 20 pieces per minute, the equivalent of four people doing the same job manually.

I will contact you in a few days to discuss the product we have returned to you, and to review the information included in this letter.

Please feel free to contact me if you have any questions. I look forward to moving forward with this project, and to a lengthy relationship between our two companies.

Best regards,



Dan O'Connell
Midwest Regional Sales Manager

c: Greg Bressler

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PTO-004183

KEY TO SAMPLE HAMS

*Note: All hams were cut in half to be vacuum packed. The two halves are labeled "A" and "B". Ham "1A" and "1B" designate the two halves of the same ham.

Honey Hams

- | | | |
|---|---------------|--|
| 1 | Ham 1A and 1B | Run Time: 9 min.
Super Smoke 50% solution |
| 2 | Ham 2A and 2B | Run Time: 9 min.
Super Smoke 50% solution |
| 3 | Ham 3A and 3B | Run Time: 8 min.
Super Smoke 33% solution |
| 4 | Ham 4A and 4B | Run Time: 7 min.
Super Smoke 33% solution |

Virginia Brand Ham

- | | | |
|---|---------------|---|
| 5 | Ham 5A and 5B | Run Time: 9 min.
Caramel 100% solution |
| 6 | Ham 6A and 6B | Run Time: 9 min.
Caramel 33% solution |

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PTO-004184

MP360.10
December 9, 1997

RWO OVEN TEST PROPOSAL

HAMS (Total of 50 hams)

RA24-P Smoke Concentrations

10%
15%
20%
25%

Times

1 minute
1.5 minutes
2 minutes

1. Put two hams through for each treatment ie: 10% at 1 minute, 10% at 1.5 min. etc.
for a total of 24 hams.

2. Evaluate hams for color and pick 2 to 3 for cooking to check rind.

3. Of hams picked for color and rind check pick 1 or 2 to re-test 4 to 6 hams each.

SMOKE CYCLE: HIGHER MOISTURE

TIME	DB	WB
:20	140	120
:20	150	140
:90	150	130-140
:20	150	140
:90	160	150
:60	170	160
—	180	180
(option)	170	170

WOOD SMOKE

STEAM COOK TO IT 170° F
STEAM COOK TO IT 148° F

10, 20, 30 %

Heat for 10, 15, 20 sec.

BACON: 38% TO 40% BELT GRILL

RA24-P Smoke application

10%
15%
20%
25%

TIME

30 sec.
45 sec.
1 minute

Chassal

Select 24P

Maillose

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PTO-004169

**HAMBURGER PATTIES
SAUSAGE LINKS AND PATTIES
MEAT BALLS
AUSSIE PIES**

Alternate solutions

10% Sugar
5% Sugar / 5% Dextrose
10% Dextrose

Malloise

10%
15%
20%
25%

Above products would be made at R&D

- 1. 50# batch of hamburger to be run through the Hollymatic**
- 2. 50# batch of sausage: 25# in links, 25# in patties**
- 3. 25# batch of meatballs: Thomas**
- 4. Aussie Pies: Horst**

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U-06924**

PTO-004170

UNITHERM OVEN TESTS

HAMS (Total of 70 hams)

RA24-P Smoke Concentration

10%

15%

20%

25%

Times

No Preheat

2 min. cook

2.5 min. cook

3 min. cook

30 sec Preheat → Preheat 1.5 min

2 min. cook

2.5 min. cook

3 min. cook

1. Put 2 hams through per treatment for a total of 48 hams.
2. Pick 2 to 3 hams for cooking tests to check for rind.
3. Repeat tests on 1 to 2 of hams picked for cook tests and re-run 4 to 6 hams each.

*VP hams - check for color retention
after 21 days.*

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U-06925**

PTO-004171

cc: M. Benson
S. Hoevet
A. Goembel
D. Ruzek

D. Wurst
L. Huston
D. Scheidt
J. Ulrich

MP360.10
December 9, 1997

F. D. Dryden

RWO OVEN TEST PROPOSAL

HAMS (Total of 50 hams)

Smoke Concentrations: RA24-P	and	Maillose
10%		10%
20%		20%
30%		30%

Times		
10 seconds		10 seconds
15 seconds		15 seconds
20 seconds		20 seconds

1. Put two hams through for each treatment for a total of 36 hams. (if times or concentrations can be seen to not be applicable, the second ham will not be tested at that level)
2. (Option) Preheat hams 5 seconds prior to drench.
3. Drench hams in smoke concentrate for 1.5 minutes.
4. Evaluate hams for color and pick 2 to 3 for cooking to check rind. (Subjective test on scale of 1 to 10)
5. Of hams picked for color and rind check, pick 1 or 2 to re-test 4 to 6 hams each.

SMOKE CYCLE: HIGHER MOISTURE

TIME	DB	WB	
:30	150	120	
:30	150	125	
:90	150	130	WOOD SMOKE DAMPER CLOSED
:30	160	140	
:-	160	160	STEAM COOK TO IT 138° - 140° F.
:-	170	170	STEAM COOK TO IT 148° - 150° F

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PTO-004172

6. Hams will be packaged as half hams.
7. After packaging, Minolta color readings will be taken.
8. Hams will be held in box for 21 days when second color reading will be taken.
9. Hams will then be placed in shelf life cooler for 60 days and observed for purg and color.

BACON: 38% TO 40% BELT GRILL

COOK TIME
5 Seconds

HAMBURGER PATTIES
SAUSAGE LINKS AND PATTIES
MEAT BALLS
AUSSIE PIES

Alternate solutions

10% Sugar
5% Sugar / 5% Dextrose
10% Dextrose

Maillose

10%
15%
20%
25%

Above products would be made at R&D

1. 50# batch of hamburger to be run through the Hollymatic
2. Special Recipe 1.5 oz. patties and 1 oz skin on links.
3. 25# batch of meatballs: Thomas
4. Aussie Pies: Horst
5. CIB Turday breast: Jennie-O

NOTE: Initial testing will be done on sausage and hamburger (Aussie pies and meat balls, if available) with a small number of hams. Major ham test will be done week of January 12.

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PTO-004173

UNITHERM OVEN TESTS

HAMS (Total of 70 hams)

Smoke Concentration: RA24-P and Maillose

10%

17.5%

25%

Times

No Preheat

2 min. cook

3 min. cook

Preheat

30 second

Drench 1.5 minutes

- 1. Put 2 hams through per treatment for a total of 48 hams.**
- 2. Pick 2 to 3 hams for cooking tests to check for rind.**
- 3. Repeat tests on 1 to 2 of hams picked for cook tests and re-run 4 to 6 hams each.**
- 4. Packaging, Minolta color tests and shelf life color tests same as for RWO.**

pjh (14850)

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U-06934**

PTO-004174

F. D. Dryden

Hormel Foods Research Report

Attention: G. Paxton - CO

W. Dion - CO

Project Name: Radiant Wall Oven / Sausage & Beef Patty Test

Copy List: M. Slette - CO
T. Byom - CO
M. Englehardt - CO
D. Franklin - CO

J. Miller - CO
D. Weber - CO
D. Scheidt - CO

Written By: S. Hoevet - 5822

J. Ulrich - 5810

SPH

JHU

Objective:

Evaluate Special Recipe Sausage and #609 hamburger in the RWO oven.

Summary:

A cutting was held at R&D on January 13, 1998. Those attending were M. Slette, D. Scheidt, J. Miller, M. Englehardt, D. Franklin, J. Ulrich and S. Hoevet.

Product shown:

Special Recipe 2 oz. Sausage patty / 1310°F. for 38 seconds
#609 Hamburger patty / 1450°F for 32 seconds

The RWO oven was used to brown the product but not to cook it through. No topical browning agent was used. A cooking unit would be utilized after the RWO to finish cooking with minimum yield loss.

Recommendation:

Foodservice requested testing be done on the following items:

1. 1 oz. and 2 oz. Special Recipe Skin On Links
2. 1 oz. and 2 oz. Country Brand Skin On Links
3. Mini meat loaves
4. Hormel Dairy Brand Bratwurst
5. Meatballs

These items will be run on January 15th and 16th and a cutting will be scheduled.

pjh (15064)

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U-06890**

PTO-004175

F. D. Dryden

Hormel Foods Research Report

Attenti n: W. Thielen - CO L. Huston - CO

Project Name: Radiant Wall Oven Ham Testing

Copy List:	M. Benson - R&D	G. Ray - CO
	G. Paxton - CO	A. Goembel - R&D
	J. Bungum - CO	D. Scheidt - CO
	J. Swedberg - CO	R. Chuick - CO
	D. Ruzek - R&D	J. Soderstrom - CO
	M. Slette - CO	D. Wurst - R&D
	D. Franklin - CO	

Written By: S. Hoevet - 5822 J. Ulrich - 5810

Objective:

Evaluate second run of hams in Radiant Wall Oven for red color

Summary:

Following directions from Marketing, a second test was made with CURE-81® hams using a modified smoke cycle in the Radiant Wall Oven for red color.

Product shown:

1. Hams drenched in a 20% solution of Red Arrow 24-P at 1140°F for 34 seconds
2. Hams drenched in a 20% solution of Red Arrow 24-P at 1100°F for 40 seconds
3. Hams drenched in a 20% solution of Red Arrow 24-P at 1000°F for 60 seconds
4. Special Recipe 2 oz. patties
5. Formula #609 hamburger made on Hollymatic at R&D

Product #3 at 1000°F for 60 seconds had acceptable color, no rind and no bitter taste.

Browning color on sausage and hamburger was excellent. Operations is considering testing the unit in Oklahoma City as a partial replacement for the char line.

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U-06888**

PTO-004176

Recommendations:

1. R&D will obtain 2 cases of regular production small CURE-81® hams with varying degrees of light and dark color and run them through the RWO at the same parameters as test #3.
2. R&D will product CURE-81® hams with starch formulation and run through RWO to determine if starch has any effect on color of product.

pjh (15066)

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U-06889**

PTO-004177

F. D. Dryden

Hormel Foods Research Report**Attention:** W. Thielen - CO L. Huston - CO**Project Name:** Radiant Wall Oven Ham Tests

Copy List: M. Benson - R&D J. Swedberg - CO
A. Goembel - R&D D. Wurst - R&D
D. Ruzek - R&D G. Paxton - CO
D. Franklin - CO M. Slette - CO
R. Chuick - CO D. Scheidt - CO

Written By: Steve Hoevet - 5822 *SPK* Jan Ulrich - 5810 *JHU***Objective:**

Achieve a red color on CURE-81® hams using the RWO oven.

Summary:

A cutting was held at R&D on January 13, 1998. Those attending were J. Swedberg, A. Goembel, D. Ruzek, M. Benson, D. Franklin, M. Slette, D. Scheidt, S. Hoevet and J. Ulrich.

Small CURE-81® hams were obtained already stuffed from the Austin Plant. Hams were heat processed at R&D using a modified cycle with minimum wood smoke for a moister ham.

Hams were processed through the Radiant Wall Oven with the following parameters.

1. 5 second drench in 15% Red Arrow 24-P liquid smoke solution then run at 1225°F through the oven at 30 seconds.
2. 5 second drench in 20% Red Arrow 24-P liquid smoke solution then run at 1260°F through oven at 27 seconds.
3. 5 second drench in 25% Red Arrow 24-P liquid smoke solution then run at 100°F through oven at 23 seconds.
4. Product was vacuum packaged immediately after processing through RWO.

Comments:

- a. The 25% solution had a bitter taste.
- b. The 20% solution had a very slight but not objectionable taste.
- c. The 15% solution had no taste.
- d. All samples had minimal rind.
- e. None of the samples achieved the optimum red color.

Recommendation:

1. R&D will continue testing with the 20% solution for red color.
2. A cutting will be held Wednesday to evaluate the second test.

pjh (15063)

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U-06886**

PTO-004178

Project #MP360.10
January 8, 1998

PROTOCOL FOR RWO HAM TESTING

1. Set oven temperature at 1300° F.
2. Mix 15%, 20% and 25% RA24-P smoke solutions.
3. Set belt speed for 23 seconds
 - a. drench 4 hams 5 seconds in 25% solution
 - b. run four hams, packaging 3 with one for cooking
4. Set belt speed for 27 seconds
 - a. drench 4 hams 5 seconds in 20% solution
 - b. drench 4 hams 5 seconds in 15% solution
 - c. run 8 hams, packaging 3 of each with one each for cooking
5. Bag hams right off conveyer belt, immediately vac packing and shrinking.
6. For cutting, cook ham of each solution and check for color, taste, rind and texture.
Check packaged hams for color.
7. Find out next steps for Wednesday run.

SMOKE CYCLE

<u>TIME</u>	<u>DB</u>	<u>WB</u>	
:20	140	120	
:20	150	140	
:90	150	140	WOOD SMOKE
:20	150	140	
:90	160	150	
:60	170	160	
--	170	170	STEM COOK TO IT 148°F.

pjh (15061)

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U-06887**

PTO-004179

F. D. Dryden

Hormel Foods Research Report

Attention: W. Dion - CO M. Slette - CO

Project Name: Radiant Wall Oven Tests

Copy List:D. Weber - CO
A. Rasell - CO
J. Miller - COM. Engelhardt - CO
D. Scheidt - CO
G. Paxton - CO

M. Benson - R&D

Written By: S. Hoevet - 5822 *[Signature]* J. Ulrich - 5810 *[Signature]***Objective:**

Show Foodservice Products run through Radiant Wall Oven

Summary:

A cutting was held at R&D on January 21, 1998. Those attending were W. Dion, D. Weber, A. Rasell, D. Scheidt, M. Slette, M. Benson, J. Ulrich and S. Hoevet.

<u>Product shown:</u>	<u>Temperature</u>	<u>Time in RWQ</u>
Mini Meat Loaf 39147	1220°F	66 sec.
Mini Meat Loaf 28337	1220°F	66 sec.
Skinless Special Recipe Links 45103	1200°F	55 sec
2 oz. Special Recipe Skin On Links 22529	1125°F	45 sec.
1 oz. Country Brand Skin On Links 42087	1125°F	45 sec.
2 oz. Country Brand Skin On Links 21216	1125°F	45 sec.
Hormel Dairy Brand Bratwurst - precooked	1430°F	12.5 sec.

Marketing liked the quality of the products shown.

Recommendation:

Operations will pursue the economics associated with this browning technology.

Hamb 1450 ° 32 sec
Sausage 1440 ° 22 sec

pjh (15180)

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U-06874**

PTO-004180

F. D. Dryden

Hormel Foods Research Report

Attention: W. Thielen - CO L. Huston - CO

Project Name: Radiant Wall Oven Further Processed Hams

Copy List:M. Benson - R&D
D. Ruzek - R&D
D. Wurst - R&D
R. Chuick - COJ. Swedberg - CO
G. Paxton - CO
M. Slette - CO
D. Scheidt - COG. Ray - CO
S. Kerber - CO
R. Slavik - CO**Written By:**S. Hoevet - 5822 *JAH*J. Ulrich - 5810 *JAH***Objective:**

Evaluate production CURE 81® hams, CURE 81® hams with modified smoke cycle, CURE 81® hams with starch both regular and modified smoke cycle further processed in a Radiant Wall Oven.

Summary:

A cutting was held at R&D on February 5, 1998. Those attending were M. Benson, D. Ruzek, J. Swedberg, D. Wurst, M. Slette, D. Scheidt, W. Thielen, L. Huston and J. Ulrich.

Product shown:

1. Production control CURE 81® hams
2. Production CURE 81® hams, light colored processed through RWO oven
3. Production CURE 81® hams, medium colored processed through RWO oven
4. Production CURE 81® hams, dark colored processed through RWO oven
5. CURE 81® hams, modified smoke cycle processed through RWO oven
6. CURE 81® hams with VA-15 starch, regular smoke cycle / Control
7. CURE 81® hams with VA-15 starch, regular smoke cycle processed through RWO oven
8. CURE 81® hams with VA-15 starch, modified smoke cycle / Control
9. CURE 81® hams with VA-15 starch, modified smoke cycle processed through RWO oven

All product processed through RWO oven had a 20% solution of RA24-P liquid smoke applied for 4 seconds and was processed at 1000°F. for 60 seconds.

Participants thought the color was excellent. There is interest in running more extensive testing in either Austin or Osceola on hams and in Oklahoma City on other products to determine feasibility of using a Radiant Wall Oven on product.

Recommendation:

1. Discuss with manufacturer the possibility of having a test unit installed to determine if there is a potential for:
 - a. increased shelf life
 - b. using a shorter smoke house cycle
 - c. uniformity of color
 - d. any other potential benefits
2. Another cutting has been set up for those who were unable to attend today.

pjh (15342)

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PTO-004181